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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,372	06/03/2005	Bernard Diem	272637US2PCT	2639

22850 7590 04/12/2007
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1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

BAUMAN, SCOTT E

ART UNIT	PAPER NUMBER
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2815

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/12/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary

Application No.

10/537,372

Applicant(s)

DIEM ET AL.

Examiner

Scott E. Bauman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-42 is/are pending in the application.
- 4a) Of the above claim(s) 36-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-35 is/are rejected.
- 7) ☒ Claim(s) 22,30,34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 June 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 02 September 2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 02 September 2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1", "17" and "18" have been used to designate the same structure in FIG. 1B. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: page 10, lines 25-26, last two sentences, "integral with a zone 9 located beyond the trench 11 compared to the assembly 10. The zone 9". For the purpose of this examination, the examiner presumes that "integral with a zone 9 located beyond the trench 11 compared to the assembly 10. The zone 9" should read "integral with a frame 9 located beyond the trench 11 compared to the assembly 10. The frame 9".

Appropriate correction is required.

4. The disclosure is objected to because of the following informalities: page 12, lines 23-24, first two sentences, "level of the zone 9. Said zone 9 takes the form of a frame 9 that is separated from the assembly 10". For the purpose of this examination, the examiner presumes that "level of the zone 9. Said zone 9 takes the form of a frame 9 that is separated from the assembly 10" should read "level of the frame 9. Said frame 9 is separated from the assembly 10".

Appropriate correction is required.

5. The disclosure is objected to because of the following informalities: page 14, lines 6-7, last sentence, "edge 8 of the package cap 5 and the zone 9 dielectric". For the purpose of this examination, the examiner presumes that "edge 8 of the package cap 5 and the zone 9 dielectric" should read "edge 8 of the package cap 5 and the frame 9 with a dielectric".

Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: page 14, line 7, last sentence, "dielectric material 22". For the purpose of this examination, the examiner presumes that "dielectric material 22" should read "dielectric layer 22".

Appropriate correction is required.

7. The disclosure is objected to because of the following informalities: page 15, line 30, "dielectric material 22". For the purpose of this examination, the examiner presumes that "dielectric material 22" should read "dielectric layer 22".

Appropriate correction is required.

8. The disclosure is objected to because of the following informalities: page 16, line 1, "dielectric material 22". For the purpose of this examination, the examiner presumes that "dielectric material 22" should read "dielectric layer 22".

Appropriate correction is required.

9. The disclosure is objected to because of the following informalities: page 16, line 23, "layer 20, zones 22 in". For the purpose of this examination, the examiner presumes that "layer 20, zones 22 in" should read "layer 20, a dielectric layer 22 of".

Appropriate correction is required.

10. The disclosure is objected to because of the following informalities: page 16, line 30, "one also deposits a zone of insulating material 22 at the level of the zone where". For the purpose of this examination, the examiner presumes that "one also deposits a zone of insulating material 22 at the level of the zone where" should read "one also deposits an insulating layer 22 at the level of the zone where".

Appropriate correction is required.

11. The disclosure is objected to because of the following informalities: page 17, line 31, "any zones 22". For the purpose of this examination, the examiner presumes that "any zones 22" should read "any dielectric layer 22".

Appropriate correction is required.

12. The disclosure is objected to because of the following informalities: page 18, line 20, "a zone 22". For the purpose of this examination, the examiner presumes that "a zone 22" should read "a dielectric layer 22".

Appropriate correction is required.

Claim Objections

13. Claims 22 and 30 objected to because of the following informalities: the term "zone". It is unclear from reading the specifications, which area or structure the term "zone" is to reference. For the purpose of this examination, the examiner presumes that the term "zone" should read "frame".

Appropriate correction is required.

14. Claim 34 objected to because of the following informalities: the term " the zone" in the last line of the claim. It is unclear from reading the specifications, which area or structure the term " the zone" is to reference. For the purpose of this examination, the examiner presumes that the term " the zone" should read "a zone of the at least one sensitive element".

Appropriate correction is required.

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15. Claim 35 objected to because of the following informalities: the phrase "the at least one sensitive element" in the last line of the claim. Since this claim depends on claim 32, examiner assumes that this would be based upon "a zone of the at least one sensitive element" and not "the at least one sensitive element". For the purpose of this examination, the examiner presumes "the at least one sensitive element" should read "a zone of the at least one sensitive element". Appropriate correction is required.

Claim Rejections - 35 USC § 112

16. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

17. Claims 22 –35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

18. Claims 22 and 30 recites the limitation "zone" in the claim language. There is insufficient antecedent basis for this limitation in the claim.

The term "zone" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear to the examiner what is ment to be described by the term "zone". Examiner cannot determine from

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reading the specifications, which structure or which area within the structure is to be considered the zone.

19. The term "a level of" in claim 31 is a relative term which renders the claim indefinite. The term "a level of" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what level is being claimed.

20. The term "integral" in claim 33 is a relative term which renders the claim indefinite. The term "integral" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear how the at least one sensitive element is integral with the substrate when the at least one sensitive element is insulated from the substrate, therefore, the examiner shall assume integral is insulating.

21. Claims 34 recites the limitation "the zone" in the claim language. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether the zone is part of the at least one sensitive element or not part of the at least one sensitive element. The specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear to the examiner what is meant to be described by the term "zone". Examiner cannot determine from reading the specifications, which structure or which area within the structure is to be considered the zone.

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22. Claim 35 recites the limitation "the at least one sensitive element" in the claim language. There is insufficient antecedent basis for this limitation in the claim.

23. Any claim not specifically addressed above, is being rejected as incorporating the deficiencies of a claim upon which it depends.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

25. Claims 22-26 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barron et al, United States Patent 5,963,788 and further in view of Muenzel et al, United States Patent 5,723,353.

26. En re claim 22:

Barron et al '788 discloses a first layer (Fig 13, item 24) insulated from a substrate (Fig 13, item 14) by an insulator layer (Fig 13, item 22) at least one sensitive element (Fig 13, item 26) connected to at least one contact pad (Fig 13, item 28) by an electrical connection (Fig 13, item 24) and protected by a package cap (Fig 13, item 34), wherein the at least one sensitive element (Fig 13, item 26), the electrical connection (Fig 13, item 24), and the at least one contact pad (Fig 13, item 28) form an assembly (Fig 13, item 12) delimited in the first layer (Fig 13, item 14) by at least one trench (Fig 13, item 30), the assembly (Fig 13, item 12) being covered by the package cap (Fig 13,

item 34), wherein the package cap (Fig 13, item 34) comprises at least one opening (Fig 13, item 44) above the at least one contact pad (Fig 13, item 28) and being integral with the at least one contact pad (Fig 13, item 28) on edges of the at least one opening (Fig 13, item 44) and a zone (Fig 13, item 18) located beyond the at least one trench (Fig 13, item 30) in relation to the assembly (Fig 13, item 12).

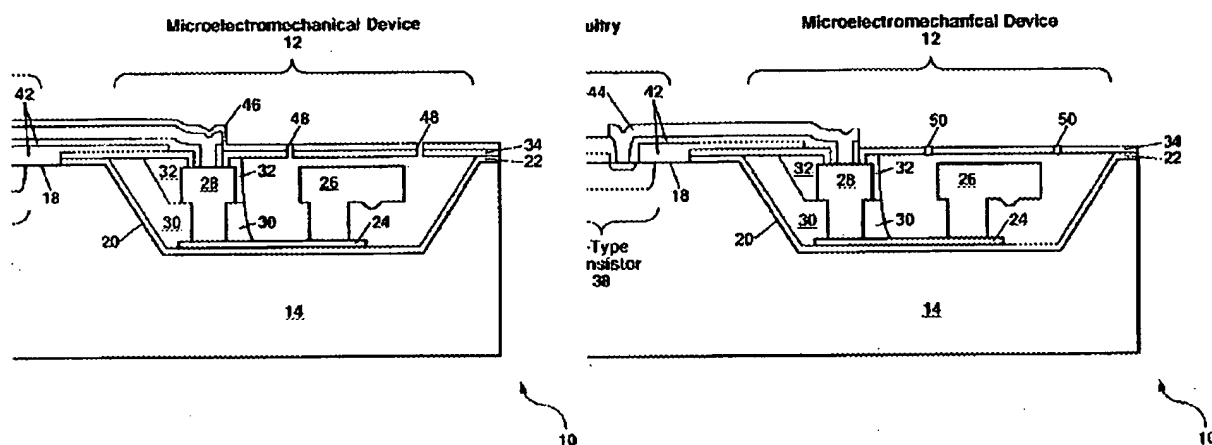


FIG. 12

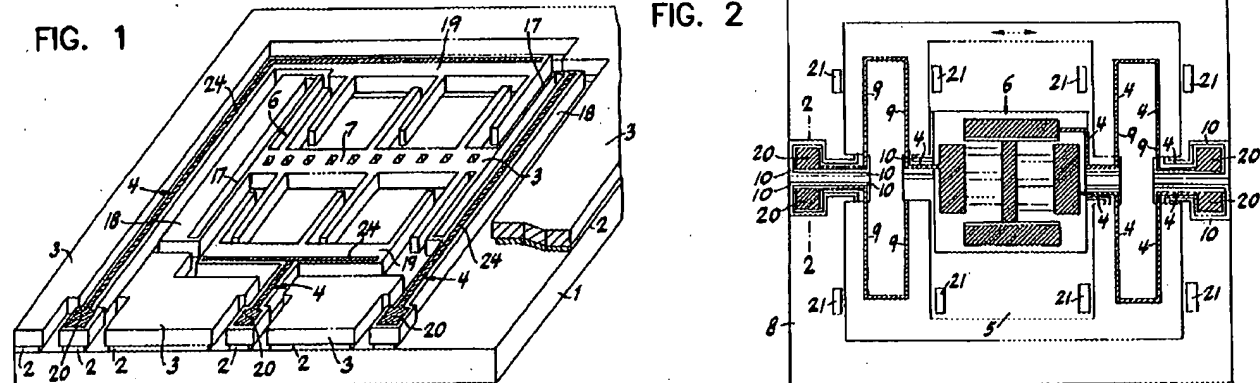
FIG. 13

Barron et al '788 does not disclose in a first layer at least one sensitive element connected to at least one contact pad by an electrical connection, wherein the at least one sensitive element, the electrical connection, and the at least one contact pad form an assembly delimited in the first layer by at least one trench.

However, Muenzel et al '353 discloses in a first layer (Col 3-4) at least one sensitive element (Fig 1, item 7) connected to at least one contact pad (Fig 1, item 20) by an electrical connection (Fig 1, item 4). wherein the at least one sensitive element

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(Fig 1, item 7), the electrical connection (Fig 1, item 4), and the at least one contact pad (Fig 1, item 20) form an assembly (Fig 1) delimited in the first layer (Fig 13, item 3) by at least one trench (Fig 2, item 10)



It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Muenzel et al '353 process for manufacturing a sensor because it provides a simple manufacturing process and an acceleration sensor that is able to be produced cost effectively (Col 1, lines 25-27).

27. En re claim 23:

Barron et al '788 discloses the package cap (Fig 13, item 34) is sealed in a leak tight manner to define a leak tight cavity (Col 10, lines 45-47) in which the at least one sensitive element (Fig 13, item 26) is located.

28. En re claim 24:

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Barron et al '788 discloses the package cap (Fig 13, item 34) further comprises at least one orifice (Fig 12, item 48) configured to be being sealed by a plug (Fig 13, item 50) to control atmosphere of the cavity (Col 10, lines 45-47).

29. En re claim 25:

Barron et al '788 discloses the electrical connection (Fig 13, item 24), the at least one contact pad (Fig 13, item 28), and the at least one sensitive element (Fig 13, item 26) are formed in a same material (Col 6, lines 41-50).

30. En re claim 26:

Barron et al '788 discloses the package cap (Fig 13, item 34) is formed in a dielectric material (Col 7, lines 54-55).

31. En re claim 31:

Barron et al '788 discloses the at least one contact pad (Fig 13, item 28) is covered with a conductive band (Fig 13, item 44) at a level of the at least one opening (Fig 13, item 44).

32. Claims 27-30, 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barron et al, United States Patent 5,963,788 and Muenzel et al, United States Patent 5,723,353 as applied to claims 22-26, and 31 above, and further in view of Eaton et al, United States Patent 6,012,336.

33. En re claim 27:

Barron et al '788 discloses the package cap (Fig 13, item 34)

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Barron et al '788 does not disclose the package cap (Fig 13, item 34) is formed in a semi-conductor or conductor material.

However, Eaton et al '336 discloses the package cap (Fig 4m, item 82) is formed in a semi-conductor or conductor material (Col 14, lines 1-4).

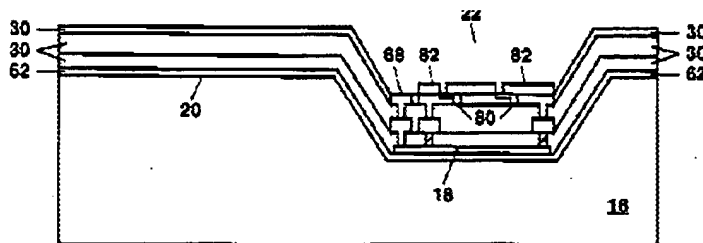


FIG. 4m

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

34. En re claim 28:

Barron et al '788 discloses the assembly (Fig 13, item 12) and the package cap (Fig 13, item 34):

Barron et al '788 does not disclose the assembly (Fig 13, item 12) and the package cap (Fig 13, item 34) are formed in a same conductor or semi-conductor material.

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However, Eaton et al '336 discloses the assembly (Fig 4p, item 12) and the package cap (Fig 4m, item 82) are formed in a same conductor or semi-conductor material (Col 13, lines 5-29; Col 14, lines 1-4).

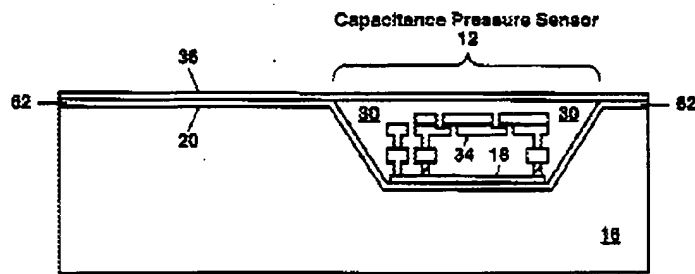


FIG. 4p

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

35. En re claim 29:

Barron et al '788 discloses a package cap (Fig 13, item 34) and the at least one contact pad (Fig 13, item 28).

Barron et al '788 does not disclose a dielectric layer insulates the package cap (Fig 13, item 34) from the at least one contact pad (Fig 13, item 28).

However, Eaton et al '336 discloses a dielectric layer (Fig 4r, item 38) insulates the package cap (Fig 4m, item 82) from the at least one contact pad (Fig 4m, item 68).

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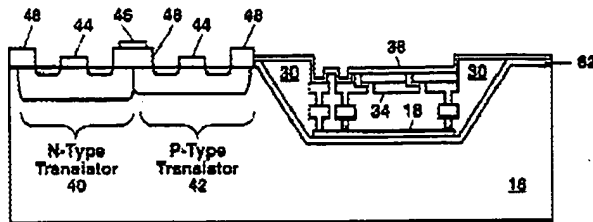


FIG. 4r

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

36. En re claim 30:

Barron et al '788 discloses the package cap (Fig 13, item 34) and the zone (fig 13, item 18).

Barron et al '788 does not discloses a dielectric layer insulates the package cap (Fig 13, item 34) from the zone (fig 13, item 18).

However, Eaton et al '336 discloses a dielectric layer (Fig 4r, item 38) insulates the package cap (Fig 4r, item 82) from the zone (fig 4r, item 48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

37. En re claim 32:

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Barron et al '788 discloses the package cap (Fig 13, item 34) and at least one sensitive element (Fig 13, item 26).

Barron et al '788 does not disclose at least one pillar resting on a zone of the at least one sensitive element (Fig 13, item 26).

However, Eaton et al '336 discloses the package cap (Fig 4m, item 82) further comprises at least one pillar (Fig 4l, item 66) resting on a zone of the at least one sensitive element (Fig 4l, item 18).

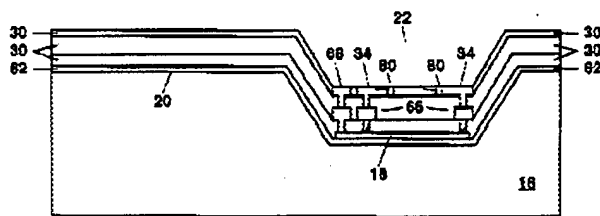


FIG. 4l

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated prevents contamination of a device surface of the substrate (Col 2, lines 50-52).

38. En re claim 33:

Barron et al '788 discloses the zone of the at least one sensitive element (Fig 13, item 26) is integral with the substrate (Fig 13, item 14).

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Barron et al '788 discloses the zone of the at least one sensitive element (Fig 13, item 26) is integral with the substrate (Fig 13, item 14).

However, Eaton et al '336 discloses the zone of the at least one sensitive element (Fig 4e, item 18) is integral (Fig 4e, item 62) with the substrate (Fig 4e, item 16).

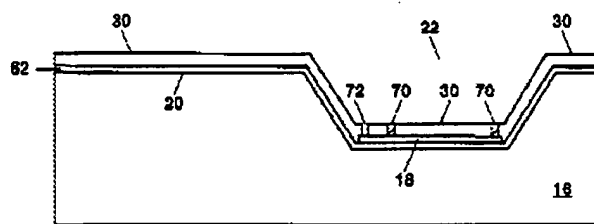


FIG. 4e

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

39. En re claim 34: (Col 14, lines 1-4).

Barron et al '788 discloses the package cap (Fig 13, item 34)

Barron et al '788 does not disclose the package cap (Fig 13, item 34) is formed in a conductor or semi-conductor material, and comprises at least one pillar resting on a zone of the at least one sensitive element , the package cap (Fig 13, item 34) and the at least one pillar contributing to forming an electrical connection with the zone.

However, Eaton et al '336 discloses the package cap (Fig 4m, item 82) is formed in a conductor or semi-conductor material (Col 14, lines 1-4), and comprises at least one pillar (Fig 4l, item 66) resting on a zone of the at least one sensitive element (Fig 4e, item 18), the package cap (Fig 4m, item 82) and the at least one pillar (Fig 4l, item 66) contributing to forming an electrical connection (Col 17, lines 2-4) with the zone (Fig 4e, item 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

40. En re claim 35:

Barron et al '788 discloses wherein the package cap (Fig 13, item 34) and the at least one sensitive element (Fig 13, item 26)

Barron et al '788 does not disclose the package cap (Fig 13, item 34) is formed in a conductor or semi-conductor material, and the at least one pillar is electrically insulated from the at least one sensitive element (Fig 13, item 26)

However, Eaton et al '336 discloses wherein the package cap (Fig 4m, item 82) is formed in a conductor or semi-conductor material (Col 14, lines 1-4), and the at least one pillar (Fig 4l, item 66) is electrically insulated (Fig 4e, item 70) from the at least one sensitive element (Fig 4e, item 18)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the method of Barron et al '788 method of integrating microelectromechanical devices with Eaton et al '336 Capacitance pressure sensor because the MEM devices being encapsulated to prevent contamination of a device surface of the substrate (Col 2, lines 50-52).

Conclusion

41. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Eliacin et al, United States Patent 6,859,119 discloses a meso-microelectromechanical system package. Eskridge et al, United States Patent 6,949,807 discloses a hermetically sealed mems device. Lee et al, United States Patent Application Publication 20050227401 discloses a method of packaging mems device in vacuum state and mems device vacuum packaged using the same. Carley, United States Patent Application Publication 20040173886 discloses micromachined assembly with a multi-layer cap defining a cavity. Silverbrook, United States Patent Application Publication 20030122227 discloses an accelerometer protected by caps applied at the wafer scale. Horning et al, United States Patent 7,005,732 discloses methods and systems for providing mems devices with a top cap and upper sense plate. Ouellet, United States Patent 6,635,509 discloses a wafer-level mems packaging. Rice, United States Patent 6,624,003 discloses an integrated mems device and package..

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott E. Bauman whose telephone number is 571-270-1443. The examiner can normally be reached on M-TH 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Scott Bauman
Examiner

EUGENE LEE
PRIMARY EXAMINER

A handwritten signature in black ink, appearing to be 'E. Lee', written in a cursive style.